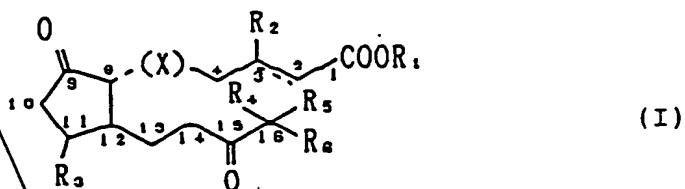


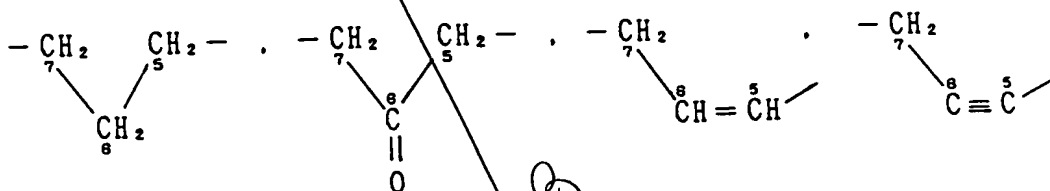
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What is claimed is :

1. Prostaglandins E represented by a general formula:



(in which X represents:



R₁ represents : hydrogen atom, physiologically acceptable salts, physiologically acceptable protective group, C₁-C₄ alkyl, benzyl, hydroxyalkyl;

R₂ represents : hydrogen atom or a methyl group;

R₃ represents : a hydroxyl, methyl, or hydroxymethyl group;

Claims
1-7

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R_4 and R_5 , each represents : hydrogen atom, methyl, hydroxyl group, or halogen atom (provided that R_4 and R_5 may be identical with or different from each other); and

R_6 represents : C_1-C_9 alkyl group which may have a branch or a double bond, or C_1-C_9 alkyl group having an alkoxy substituent group,

in which C_2-C_3 bond may be a double bond; except that all R_1 , R_2 , R_4 and R_5 are hydrogen atom, R_6 is n-butyl, and R_3 is hydroxyl.)

2. Prostaglandins E as described in claim 1, wherein R_4 and/or R_5 is a halogen.

3. Prostaglandins E as described in claim 1, wherein R_4 and/or R_5 is a fluorine atom.

4. Prostaglandins E as described in claim 1, wherein R_4 and/or R_5 is a methyl group.

5. Prostaglandins E as described in claim 1, wherein R_3 is a methyl group.

6. Prostaglandins E as described in claim 1, having a methyl group on 19 position thereof.

7. Prostaglandins E as described in claim 1, wherein R_6 is a hexyl group.

8. Prostaglandins E as described in claim 1, wherein R_6 is an isopentyl group.

9. Prostaglandins E as described in claim 1, wherein R_6 is a pentyl-2S-group.

10. Prostaglandins E as described in claim 1, of which carboxyl group on the terminal position of

α -chain is esterified with alkyl group.

11. Prostaglandins E as described in claim 1, which is 13,14-dihydro-15-keto-PGE having methyl group or fluorine atom on 16-position or alkyl ester thereof.

12. Prostaglandins E as described in claim 1 which is 13,14-dihydro-15-keto-16R,S-methyl-PGE₂ or alkyl ester thereof.

13. Prostaglandins E as described in claim 1 being 13,14-dihydro-6,15-diketo-16R,S-methyl-PGE₁ or alkylester thereof.

14. Prostaglandins E as described in claim 1 being 13,14-dihydro-15-keto-16R,S-fluoro-PGE₂ or alkyl ester thereof.

15. Prostaglandins E as described in claim 1 being 13,14-dihydro-6,15-diketo-16R,S-fluoro-PGE₁ or alkyl ester thereof.

16. Prostaglandins E as described in claim 1 being 13,14-dihydro-15-keto-19-methyl-PGE₂ or alkyl ester thereof.

17. Prostaglandins E as described in claim 1 being 13,14-dihydro-6,15-diketo-19-methyl-PGE₁ or alkyl ester thereof.

18. Prostaglandins E as described in claim 1 being 13,14-dihydro-15-keto-20-ethyl-PGE₂ or alkyl ester thereof.

19. Prostaglandins E as described in claim 1 being 13,14-dihydro-15-keto-11-dehydroxy-11R-methyl-PGE₂ or alkyl ester thereof.

20. Prostaglandins E as described in claim 1 being 13,14-dihydro-6,15-diketo-11-dehydroxy-11R-methyl PGE₁ or alkyl ester thereof.

21. Prostaglandins E as described in claim 1 being 13,14-dihydro-15-keto-16,16-difluoro-PGE₂ or alkyl ester thereof.

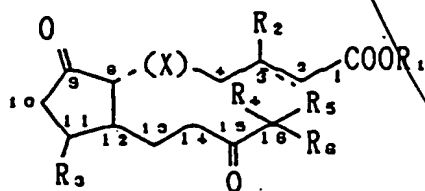
22. Prostaglandins E as described in claim 1 being 13,14-dihydro-15-keto-20-methyl-PGE₁ or alkyl ester thereof.

23. Prostaglandins E as described in claim 1 being 13,14-dihydro-15-keto-Δ²-PGE₁ or alkyl ester thereof.

24. Prostaglandins E as described in claim 1 being 13,14-dihydro-15-keto-16R,S-fluoro-20-methyl-PGE₂ or alkyl ester thereof.

25. Prostaglandins E as described in claim 1 being 13,14-dihydro-15-keto-5,6-dehydro-20-methoxy-PGE₂ or alkyl ester thereof.

26. An antiulcer composition composing prostaglandins E expressed by a general formula:



(I)

(in which X represents:

R₁ represents : hydrogen atom, physiologically acceptable salts, physiologically acceptable protective group, C₁-C₄ alkyl, benzyl hydroxyalkyl;

R₂ represents : hydrogen atom or a methyl group;

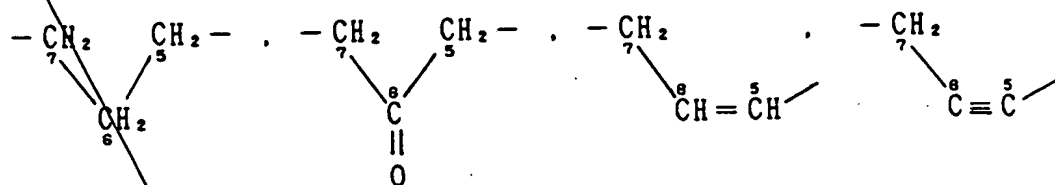
R₃ represents : a hydroxyl, methyl, or hydroxymethyl group;

R₄ and R₅, each represents : hydrogen atom, hydroxyl group, or halogen atom (provided R₅ may be identical with or different from R₄);

R₆ represents : C₁-C₉ alkyl group which may contain one or more double bonds, or C₁-C₉ alkenyl substituent group,

in which C₂-C₃ bond may be a double bond; provided that all R₁, R₂, R₄ and R₅ are hydrogen atoms, except where R₁ is n-butyl, and R₂ is hydroxyl.)

27. An antiulcer composition as claimed in claim 26 wherein R₄ and/or R₅ is a halogen atom.



R₁ represents : hydrogen atom, physiologically acceptable salts, physiologically acceptable protective group, C₁-C₄ alkyl, benzyl, hydroxyalkyl;

R₂ represents : \hydrogen atom or a methyl group;

R₃ represents : a hydroxyl, methyl, or hydroxymethyl group;

R_4 and R_5 , each represents : hydrogen atom, or a methyl, hydroxyl group, or halogen atom (provided that R_4 and R_5 may be identical with or different from each other); and

~~R₆ represents : C₁-C₉ alkyl group which may have a branch or a double bond, or C₁-C₉ alkyl group having an alkoxy substituent group,~~

in which C₂-C₃ bond may be a double bond; except that all R₁, R₂, R₄ and R₅ are hydrogen atom, R₆ is n-butyl, and R₇ is hydroxyl.)

27. An antiulcer composition as described in claim 26 wherein R₄ and/or R₅ is a halogen.

28. An antiulcer composition as described in claim 26 wherein R_4 and/or R_5 is a fluorine atom.

29. An antiulcer composition as described in claim 26 wherein R_4 and/or R_5 is a methyl group.

30. An antiulcer composition as described in claim 26 wherein R_3 is a methyl group.

31. An antiulcer composition as described in claim 26 comprising prostaglandin E of claim 26 having a methyl group on 19-position.

32. An antiulcer composition as described in claim 26 wherein R_6 is a hexyl group.

33. An antiulcer composition as described in claim 26 wherein R_6 is an isopentyl group.

34. An antiulcer composition as described in claim 20 wherein R_6 is a pentyl-2S-group.

35. An antiulcer composition as described in claim 26 wherein the prostaglandines E of which carboxyl group on the terminal position of α -chain is esterified with alkyl group are contained.

36. An antiulcer composition as described in claim 26 wherein the prostaglandins E are 13,14-dihydro-15-keto-PGEs having a methyl group or fluorine atom on 16-position or alkyl ester thereof.

37. An antiulcer composition as described in claim 26 wherein the prostaglandin E is 13,14-dihydro-15-keto-16R,S-methyl-PGE₂ alkyl ester.

38. An antiulcer composition as described in claim 26 wherein the prostaglandin E is 13,14-dihydro-6,15-diketo-16R,S-methyl-PGE₁-alkyl ester.

39. An antiulcer composition as described in claim 26 wherein the prostaglandin E is 13,14-dihydro-15-keto-16R,S-fluoro-PGE₂ or alkyl ester thereof.

40. An antiulcer composition as described in claim 26 wherein the prostaglandin E is 13,14-dihydro-6,15-diketo-16R,S-fluoro-PGE₁ or alkyl ester thereof.

41. An antiulcer composition as described in claim 26 wherein the prostaglandin E is 13,14-dihydro-15-keto-19-methyl-PGE₂ or alkyl ester thereof.

42. An antiulcer composition as described in claim 26 wherein the prostaglandin E is 13,14-dihydro-6,15-diketo-19-methyl-PGE₂ or alkyl ester thereof.

43. An antiulcer composition as described in claim 26 wherein the prostaglandin E is 13,14-dihydro-15-keto-20-ethyl-PGE₂ or alkyl ester thereof.

44. An antiulcer composition as described in claim 26 wherein the prostaglandin E is 13,14-dihydro-15-keto-11-dehydroxy-11R-methyl-PGE₂ or alkyl ester thereof.

45. An antiulcer composition as described in claim 26 wherein the prostaglandin E is 13,14-dihydro-6,

15-diketo-11-dehydroxy-11R-methyl-PGE₁ or alkyl ester thereof.

46. An antiulcer composition as described in claim 26 wherein the prostaglandin E is 13,14-dihydro-15-keto-16,16-difluoro-PGE₂ or alkyl ester thereof.

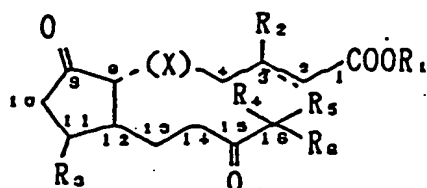
47. An antiulcer composition as described in claim 26 wherein the prostaglandin E is 13,14-dihydro-15-keto-20-methyl-PGE₁ or alkyl ester thereof.

48. An antiulcer composition as described in claim 26 wherein the prostaglandin E is 13,14-dihydro-15-keto- Δ^2 -PGE₁ or alkyl ester thereof.

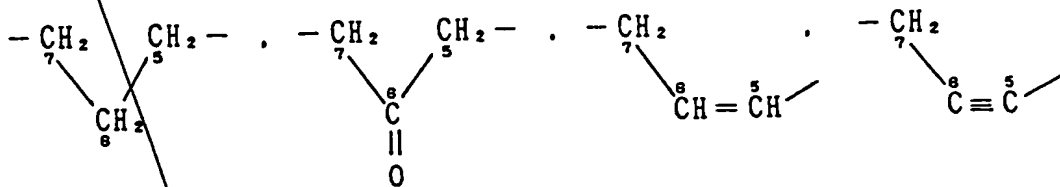
49. An antiulcer composition as described in claim 26 wherein the prostaglandin E is 13,14-dihydro-15-keto-16R,S-fluoro-20-methyl-PGE₂ or alkyl ester thereof.

50. An antiulcer composition as described in claim 26 wherein the prostaglandin E is 13,14-dihydro-15-keto-5,6-dehydro-20-methoxy-PGE₂ or alkyl ester thereof.

51. A treatment of ulcer by administering prostaglandins E to a patient, wherein the prostaglandins E are represented by a formula:



--- (in which X represents:



- R_1 represents : hydrogen atom, physiologically acceptable salts, physiologically acceptable protective group, C_1 - C_4 alkyl, benzyl, hydroxyalkyl;
- R_2 represents : hydrogen atom or a methyl group;
- R_3 represents : a hydroxyl, methyl, or hydroxymethyl group;
- R_4 and R_5 , each represents : hydrogen atom, or a methyl, hydroxyl group, or halogen atom (provided that R_4 and R_5 may be identical with or different from each other); and
- R_6 represents : C_1 - C_9 alkyl group which may have a branch or a double bond, or C_1 - C_9 alkyl group having an alkoxy substituent group,
- in which C_2 - C_3 bond may be a double bond; except that all R_1 , R_2 , R_4 and R_5 are hydrogen atom, R_6 is n-butyl, and R_2 is hydroxyl.)

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